

8 December 1965

OSCILLOSCOPE AN/GSM-77

Cog Service: USN

FSN:

Functional Class:

USA

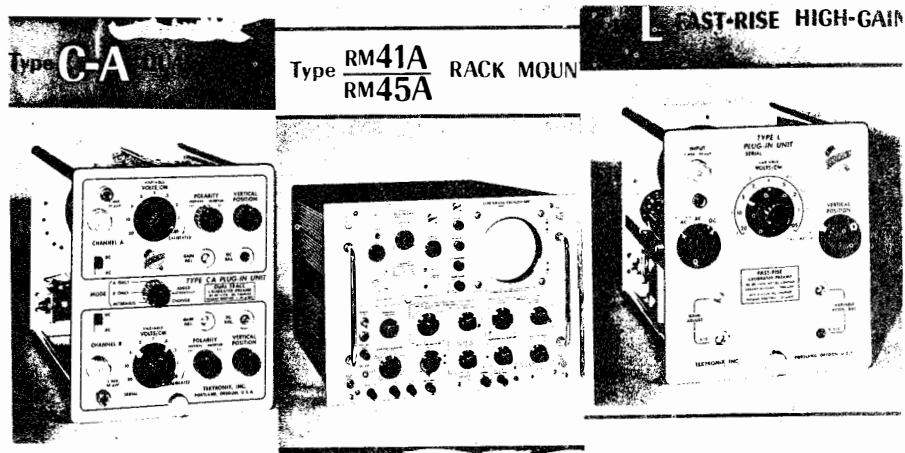
USM

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Cooke Engineering Company, (02002).



OSCILLOSCOPE AN/GSM-77

FUNCTIONAL DESCRIPTION:

Oscilloscope AN/GSM-77 is a wide-range, general purpose laboratory instrument. It may be operated with any Tektronix letter-series plug-in unit to satisfy the requirements for virtually any application.

No field changes in effect at time of preparation (15 October 1965).

RELATION TO OTHER EQUIPMENT:

The AN/GSM-77 is the same as Tektronix Type RM45A with plug-in units CA and L. The Tektronix Type RM45A is a rack mounted version of type 545A.

OSCILLOSCOPE AN/GSM-77

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

TRIGGERING MODES

TIME BASE A: Automatic, AC, DC, AC Low Frequency Reject, and High Frequency Sync.

TIME BASE B: Automatic, AC, and DC.

INTERNAL TRIGGERING: A signal producing 2 mm of vertical deflection.

EXTERNAL TRIGGERING: A signal of 0.2 v to 10 v.

HIGH FREQUENCY SYNC: Assures a stable display of sine wave signals to approx 30 mc.
Requires a signal producing 2 cm of vertical deflection or an external signal of more than 2 v.

SWEEP SPEEDS

TIME BASE A: 0.1 usec to 5 sec/cm in 24 accurately calibrated steps. An uncalibrated control permits sweep speeds to be varied continuously between 0.1 usec and approx 12 sec/cm. Calibrated sweep speeds are typically within 1%, and in all cases within 3% of the indicated sweep rate.

TIME BASE B: 2 usec to 1 sec/cm in 18 accurately calibrated steps. Sweep speeds are typically within 1%, and in all cases within 3% of the indicated sweep rate.

MAGNIFIER: Provides a 5-times magnification of the center 2 cm portion of the oscilloscope display. Extends the fastest Time Base A sweep speed to 0.002 usec/cm and the fastest Time Base B sweep speed to 0.4 usec/cm.

EXTERNAL HORIZONTAL INPUT

DEFLECTION FACTOR: Approx 0.2 to 15 v/cm, continuously variable.

FREQUENCY RESPONSE: From dc to 240 kc. Response down 3 db at 240 kc.

HORIZONTAL INPUT CONNECTOR CHARACTERISTICS: 1 megohm paralleled by approx 55 uuf.

DELAYED SWEEP: Continuously variable from 1 usec to 10 sec. Actual delay steps within 1% of indicated delay; incremental delay accurate within 0.2%.

JITTER: 1 part in 20,000.

CATHODE-RAY TUBE: Type 5BHP2, phosphor type, w/4 x 10 cm viewing area.

GRATICULE

ILLUMINATION: Variable edge lighting.

MARKINGS: 4 vertical and 10 horizontal 1 cm div w/2 mm markings on the centerlines.

AMPLITUDE CALIBRATOR

WAVEFORM: Square-waves at approx 1000 cyc.

OUTPUT VOLTAGE: 0.2 mv peak-to-peak to 100 v peak-to-peak in 18 steps.

ACCURACY: Peak-to-peak amplitude of square-waves within 3% of indicated V.

POWER SUPPLIES: 105 to 125 v, or 210 to 250 v, 50 to 60 cps, 500 W with a type CA Plug-In Unit installed.

OUTPUT WAVEFORMS AVAILABLE

DELAYED TRIGGER PULSE: Approx 5 v in amplitude occurring at the end of delay period.

POSITIVE GATE B: 30 v peak-to-peak with same duration as sweep B.

POSITIVE GATE A: 30 v peak-to-peak with same duration as sweep A.

SAWTOOTH A: Sweep A sawtooth waveform, 150 v peak.

VERTICAL SIGNAL OUTPUT: Output from vertical deflection system. Approx 1.5 v peak-to-peak per cm of vertical deflection.

VENTILATION: Forced filtered air. Thermal relay interrupts instrument power in the event of over heating.

OSCILLOSCOPE AN/GSM-77

PLUG-IN UNIT CA (PREAMPLIFIER AM-3281/GSM-77)

OPERATING MODES: Channel A only; Channel B only; Electronic switching at 100 kc (chopped); Electronic switching on alternate sweeps; Both channels combined at output (A ± B).

AMPLIFIER SENSITIVITY

BASIC DEFLECTION FACTOR: 0.05 v/cm, ac or dc.

NINE CALIBRATED SENSITIVITIES: 0.05 v/cm to 20 v/cm, accurate within 3% when set on any one step.

AMPLIFIER TRANSIENT RESPONSE: Risetime 0.015 usec, dc to 24 mc.

INPUT IMPEDANCE: 1 megohm shunted by 20 uuf.

PLUG-IN UNIT L (PREAMPLIFIER AM-3280/GSM-77).

DEFLECTION FACTOR

AC OR DC COUPLED: 0.05 V/CM. 9 calibrated steps from 0.05 v/cm to 20 v/cm.

AC COUPLED ONLY: 0.005 V/CM. 10 x gain amplifier switched in provides 9 calibrated steps from 0.005 v/cm to 2 v/cm.

FREQUENCY RESPONSE AND RISE TIME (AT 3DB DOWN)

0.05 to 40 V/CM: DC to 30 mc, 12 usec.

0.005 to 4 V/CM: 3 cyc to 24 mc, 15 usec.

INPUT IMPEDANCE: 1 megohm shunted by 20 uuf.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Oscilloscope AN/GSM-77 includes:			
1	Oscilloscope OS-135(P)/GSM-77		14 x 19 x 21-3/4	75.50
1	Preamplifier AM-3280/GSM-77		5-1/2 x 7 x 9	4.50
1	Preamplifier AM-3281/GSM-77		5-1/2 x 7 x 9	4.75
1	Interconnecting Box J-2014/GP			
1	Set of Accessories includes:			
2	Binding Post Adapters			
1	Green Filter			
1	Test Lead			
1	Power Cord (3 conductor)			
2	10-X Attenuator Probe			
1	Set Mounting Hardware			
1	Technical Manual			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94060: Operating and Maintenance Instructions for Dual Trace Oscilloscope Type RM45A and Addendum for Plug-in-Unit Type CA.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not available.

OSCILLOSCOPE AN/GSM-77

CRYSTALS: Not available.

SEMI-CONDUCTORS: Not available.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
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PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Cooke Engineering Company	Alexandria, Va.	N0bsr 85438	

TEST SET RADIO AN/PRM-28(XN-1)

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Fairchild Camera and Instrument Corp.	Clifton, New Jersey	N0bsr-87635	

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10 December 1965

Cog Service: USN FSN:

TEST SET RADIO AN/URM-134A

Functional Class:

USA

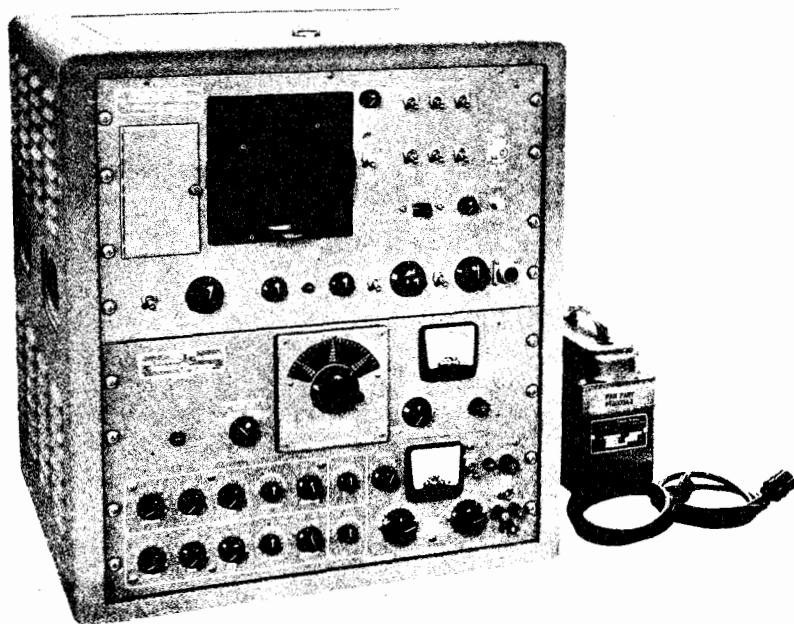
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: The Singer Co., Metrics Division, Gertsch Dept., (88869).



TEST SET RADIO AN/URM-134A

FUNCTIONAL DESCRIPTION:

The Test Set Radio AN/URM-134A is a comprehensive, general utility spectrum analyzer for field and Laboratory use in single sideband and other narrow band communications system. It provides for rapid and highly accurate evaluations of transmitter and receiver performance over a 60 db dynamic range.

No field changes in effect at time of preparation (20 October 1965).

RELATION TO OTHER EQUIPMENT:

The AN/134A is two-way interchangeable, except by maintenance parts with the AN/URM-134.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

4.3 AN/URM-134A: 1

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TEST SET RADIO AN/URM-134A

TECHNICAL CHARACTERISTICS:

SWEEP WIDTHS AND SWEEP RATES

PRESET	VARIABLE
SWEEP WIDTH: 150 cps, 500 cps, 3.5 kc, 7 kc, 14 kc	0-100 kc and 0-2 kc with AFC
SWEEP RATE: (CPS) 0.1, 0.1, 1, 1, 1	0.1 to 30
RESOLUTION (3DB DOWN): 10 cps, 18 cps, 150 cps, 220 cps, 350 cps	10 cps to 1.8 kc

MINIMUM FREQUENCY SEPARATION FOR MEASUREMENT 60 DB DOWN: 60 cps, 100 cps, 600 cps, 900 cps, 1.4 kc.

INPUT ATTENUATOR: 0 to 50 attenuation of the input signal in one db steps continuous 20 db gain control.

AMPLITUDE SCALES: Linear and two decade log, selectable by a front panel switch. Front panel 20 db IF attenuator may be used to extend the calibrated range to 60 db.

TWO-TONE TEST: All in-band residual (odd-order) intermodulation products better than 60 db below the level of two equal amplitude reference signals deflected 20 db above full scale on log amplitude.

AF TEST TONES: Two tones each continuously variable between 100 cps to 10 kc.

RF TEST TONES: 3000 kc, crystal controlled and 3002 kc, crystal controlled.

INPUT CENTER FREQUENCY: 500 kc.

BANDPASS REGION: (After input mixer) 450 to 550 kc.

IMAGE REJECTION: Better than 100:1 at input center frequency.

INPUT IMPEDANCE: 50 ohms direct. 12 megohms shunted by 5 uuf with accessory high impedance probe.

FREQUENCY RANGE: 2 to 40 mc continuously tuned.

SWEEP WIDTHS

FIXED: 150 cps, 500 cps, (with AFC) 3.5 kc, 7 kc, 14 kc.
CONTINUOUSLY VARIABLE: 0 to 100 kc, 0 to 2 kc (with AFC).

TYPES OF TESTS: Analysis of in-band distortion of single sideband transmitters and exciters by two tone test method.

MEASUREMENT: Of suppressed carrier levels and residual unwanted sidebands.

MONITORING: Of transmission bandwidth.

HUM: Sideband studies.

OUT-OF-BAND: Signal studies of harmonics, cross products, parasites, etc.

NARROW BAND: RF studies of up to plus or minus 50 kc in AM, FM, PM, and multiplexed channels.

POWER REQUIREMENTS: 115 v ac, 60 cyc, single ph.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Test Set Radio AN/URM-134A		20-1/4 x 22 x 23-1/4	120
	includes:			
1	Radio Frequency Oscillator SG-404/UR			
1	Signal Generator SG-403/URT			
1	Cathode Follower Probe Model TTG-2			

4.3 AN/URM-134A: 2

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TEST SET RADIO AN/URM-134A

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Electrical Equipment Cabinet CY-3068/URM-134			
1	Spectrum Analyzer Set AN/URM-135AA			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94791: Instruction Manual for Radio Set AN/URM-134A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 0A2 (1) 0B2 (1) 5ADP7 (1) 5V4GA (2) 6AH6 (1) 6AS7G (4) 6AU6
 (1) 6BE6 (2) 6BH6 (2) 6C16 (1) 6J6 (4) 6U8A (2) 5651 (1) 12AL5
 (1) 12AT7 (7) 12AU7 (1) 12AX7 (1) 6AF4A (1) 6922 (1) 7586 (1) 5718

CRYSTALS: (3) 100 kc (1) 500 kc (1) 3000 kc (1) 3002 kc

SEMI-CONDUCTORS: (1) 1N81A (1) 1N2389 (1) 1Z5.8T5 (4) M-500 (2) 10A/10LF
 (6) 2N404

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SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN DESIGN COG: USN, BuShips
 SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Singer Co., Metrics Division, Gertsch Dept.	Los Angeles, California	NObsr-87718	\$3,881.76

UNCLASSIFIED
ELECTRONIC EQUIPMENT - PRELIMINARY DATA
NAVSHIPS 4457 (Rev. 9-62) (CONT'D)

NAVSHIPS 93400

DESIGNATION	ITEM NAME
AN/USM-139	Oscilloscope
FUNCTIONAL DESCRIPTION: SKETCH. MFG. DIMENSIONS, ETC.	

The AN/USM-139 is a high-speed oscilloscope with a 5-inch screen for general-purpose use in the laboratory for the observation and precise measurement of waveforms. The AN/USM-139 is used with, but it is not a part of, MX-2931/USM-105 and MX-2962/USM-105A. Sweep data (trigger or free running): one microsecond to 150 seconds sweep duration and amplitude of 0.5v to 60v peak-to-peak. Polarity switch and level control are included. The rated deflection sensitivity through the amplifier is 0.02v rms per cm vertical and 0.1 to 12.5v rms on horizontal. For direct connection to the plates, the sensitivity is 7v rms on both vertical and horizontal. The rated frequency response is 0-1 mc per sec on the X-axis and 0-30 mc per sec on the Y-axis, with the Z-axis not rated. Rated impedance for the amplifier output is 1 meg (with 30 uuf shunt) on the X- and Y-axis and 2 megs on the Z-axis. Oscilloscope AN/USM-139 is identical to Oscilloscope AN/USM-105A except for an appropriate rack mounted case instead of a combination case. It is a part of Height Finding Radar Set AN/SPS-30.

Special features:

Two vertical input channels: 0.02v/cm to 50v/cm, ten ranges from 0.02v/cm to 20v/cm ± 5 percent.

Sweep speed ranges, in 24 steps: 0.1 usec/cm to 5 sec/cm ± 3 percent. Vernier extends sweep to 15 sec/cm.

Sweep magnification: 7 calibrated ranges, X1, X2, X5, X10, X20, X50, and X100. Increases fastest sweep speed to 0.02 usec/cm. Accuracy: X1, X2, and X5, ± 3 percent; X10 and X20; ± 5 percent to 0.02 usec/cm; X50 and X100, ± 10 percent to 0.02 usec/cm.

Trigger amplitude: 0.5v p-p external or 2mm deflection internal. One preset adjustment provides triggering to 14 mc.

Pushbutton beam-finder automatically returns trace to screen and indicates correct direction and amount of position control adjustment to center trace.

Dual-trace vertical amplifier and auxiliary unit plug in from front panel simultaneously and are individually removable from the front panel to permit inserting other vertical and horizontal plug-in units to provide other functions including Variable Calibrated Sweep Delay and X-Y recorder output for automatically recording the trace with any sweep speed up to 5 usec/cm at repetition rates greater than 20 cps.

No unit cost available

Source of information: Request for Nomenclature
Nomenclature correspondence
Contract

4.3 AN/USM-139: 2

CLASSIFICATION

UNCLASSIFIED

Rev 12/1/62

CHANGE 66 - 679A

86

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CLASSIFICATION of Equip. UNCLASSIFIED		COMMON NAME Oscilloscope	NOMENCLATURE AN/USM-110
SPECIFICATION MIL-0-22237(SHIPS)		CONTRACT NUMBER AND DATE N600(19)58138	DATE of Request 15 Oct 1961
CONTRACTOR'S NAME AND ADDRESS Hewlett-Packard Company 1501 Page Mill Road Palo Alto, California			QUANTITY ON ORDER -
			SERVICE APPROVAL LETTER - SERIAL AND DATE -

ELECTROCHEMICAL CHARACTERISTICS

POWER INPUT 115 or 230v, 50 to 60 cycle, single phase	WAVE GUIDE OR CABLE LIMITATIONS -		POWER OUTPUT -
OUTPUT SIGNAL CHARACTERISTICS (REP. RATE, I.F., ETC.)	EMISSION OR RECEPTION (TYPE) -	FREQ. CONTROL (TYPE) -	NO. OF CHANNELS -
OPERATING FREQ. AND FREQ. RANGE 0.063 cps to 1 mc	IMPEDANCE (OHMS) See reverse	FEED TYPE -	BEAM PATTERN °HORIZ. °VERT.

REFERENCE DATA AND LITERATURE

DRAWING	DWG. NUMBER	DIST. DATE	PUBLICATION	PUB. NUMBER
			TECHNICAL MANUAL	NS 94507
			OPERATING INSTRUCTION CHART	-
			PERFORMANCE STANDARD SHEET	-
			MAINTENANCE STANDARD BOOK	-

EQUIPMENT SUPPLIED

QTY	NOMENCLATURE AND NAME	OVERALL DIMENSIONS (IN)			H.D. (UNITS)	WEIGHT (LBS)
		HEIGHT	WIDTH	DEPTH		
1	Oscilloscope AN/USM-110 consists of:					
1	Oscilloscope OS-121/USM-110	21-1/8	19	11-3/4		
1	Dual Trace Amplifier Vertical Channel Oscilloscope Subassembly MX-2930A/USM-105					
1	Auxiliary Plug-in Unit horizontal Channel Oscilloscope Subassembly MX-3078/USM-105A					
2	Adapter UG-255/U					
2	Adapter UG-273/U					
2	Adapter UG-274/U					
4	Connector Adapter UG-1035/U					
2	Cord CG-1109E/U (8 feet)					
1	Electrical Power Cable Assembly CX-4704/U					
1	Oscilloscope Cover CW-511/USM-105					
2	Test Prod MX-2817/U					

IF ADDITIONAL EQUIPMENTS OR UNITS ARE REQUIRED, ATTACH ADDITIONAL SHEETS AND SPECIFY SOURCE.

CLASSIFICATION

NOMENCLATURE AN/USM-140	COMMON NAME Oscilloscope
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FUNCTIONAL DESCRIPTION: SKETCH, MFG. DIMENSIONS, ETC.

The AN/USM-140 is a high-speed oscilloscope with a 5-inch screen for general-purpose use in the laboratory for the observation and the precise measurement of waveforms. The unit is bench mounted; for a rack-mounted unit, see AN/USM-141. The AN/USM-140 is used with, but it is not a part of, MX-2931/USM-105 and MX-2962/USM-105A. Sweep data (trigger or free running): one microsecond to 150 seconds sweep duration, 0.5v to 60.0v peak-to-peak. The rated deflection sensitivity through the amplifier is 0.02v rms per cm vertical and 0.1 to 12.5v rms on horizontal. For direct connection to the plates, the sensitivity is 7v rms for both vertical and horizontal. The rated frequency response is 0 to 1 mc per sec on the X-axis and 0 to 30 mc per sec on the Y-axis with the Z-axis not rated. The rated impedance for the amplifier input is one meg (with 30 uuf shunt) on the X- and the Y-axis and two meg on the Z-axis.

Special features:

- Two vertical input channels: 0.02v/cm to 50v/cm, ten ranges from 0.02v/cm to 20v/cm ± 5 percent.
- Sweep speed ranges, in 24 steps: 0.1 usec/cm to 5 sec/cm ± 3 percent. The vernier extends sweep to 15 sec/cm.
- Sweep magnification: 7 calibrated ranges, X1, X2, X5, X10, X20, X50, and X100. Increases fastest sweep speed to 0.02 usec/cm. Accuracy: X1, X2, and X5, ± 3 percent; X10 and X20 ± 5 percent to 0.02 usec/cm, X50 and X100 ± 10 percent to 0.02 usec/cm.
- Trigger amplitude: 0.5v p-p external or 2 mm deflection internal. One preset adjustment provides triggering to 14 mc.
- Pushbutton beam-finder automatically returns trace to screen and indicates correct direction and amount of position control adjustment to center trace.
- Dual-trace vertical amplifier and auxiliary unit plug in from front panel simultaneously and are individually removable from the front panel to permit inserting other vertical and horizontal plug-in units to provide other functions including Variable Calibrated Sweep Delay and X-Y recorder output for automatically recording the trace with any sweep speed up to 5 usec/cm at repetition rates greater than 20 cps.

No unit cost available

Source of information: Request for Nomenclature
No contract available
Nomenclature correspondence
Technical Manual not available

CLASSIFICATION
UNCLASSIFIED

Rei 12/1/62

CHANGE 55/66 - 679A

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C-33743

23 October 1964

OSCILLOSCOPE AN/USM-140A

Cog Service: USN FSN: 2F6625-987-6603

Functional Class:

USA

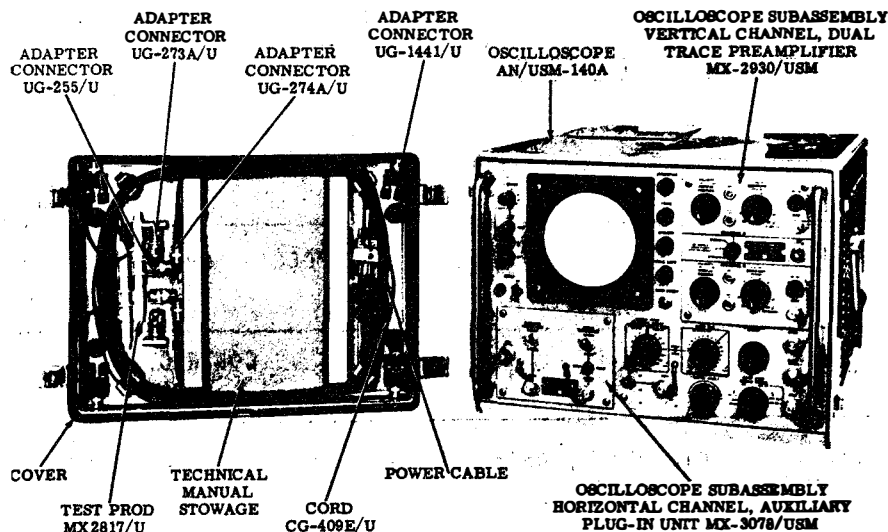
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: The Hickok Electrical Instrument Co., (28596).



OSCILLOSCOPE AN/USM-140A

FUNCTIONAL DESCRIPTION:

Oscilloscope AN/USM-140A is a precision instrument intended for laboratory use to visually display electrical impulses. The vertical deflection amplifier bandpass is designed for operation from dc to 30 megacycles. The Oscilloscope incorporates high linearity sweep generators for triggered or free running sweeps. Calibrated dials provide easy adjustment for a wide range of sensitivities and normal or expanded sweeps. A beam finder push button simplifies the problem of finding and centering an off screen trace. A voltage calibrator is built in to provide standardizing voltages in the millivolt or volt ranges.

No field changes in effect at time of preparation (19 October 1964).

RELATION TO OTHER EQUIPMENT:

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AN/USM-140A OSCILLOSCOPE

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

- (1) AM-3567/USM High Gain Amplifier; (1) AM-3568/USM High Gain Wide Band Amplifier;
- (1) MX-2962/USM Delay Generator.

TECHNICAL CHARACTERISTICS:

TEMPERATURE AND HUMIDITY

TEMPERATURE RANGE: -28°C to $+50^{\circ}\text{C}$ with a relative humidity of 99%.

RANGE 1: $+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ with a relative humidity not greater than 75%.

RANGE 2: 0°C to $+50^{\circ}\text{C}$ w/a relative humidity of not greater than 90%.

RANGE 3: -28°C to $+50^{\circ}\text{C}$ w/a relative humidity of not greater than 99%.

VERTICAL AMPLIFIER

ACCURACY: $\pm 3\%$ over all accuracy over temp and humidity range 1 of paragraph 1 - 3a;

$\pm 5\%$ over temp and humidity range 3.

PASS BAND

DC COUPLED: DC to 30 mc (3 db), 12 usec rise time.

HORIZONTAL AMPLIFIER

PASS BAND

DC COUPLED: DC to 1 mc (3 db).

AC COUPLED: 2 cps to 1 mc (3 db points).

INPUT IMPEDANCE: Nom 1 megohm, shunted by 30 pf.

SENSITIVITY: 0.1 volt/cm to 10 volts/cm vernier extends min sensitivity to 25 volts/cm seven ranges.

SWEEP GENERATOR

CALIBRATIONS: 24 sweep ranges, from 0.1 usec/cm to 5 sec/cm w/ $\pm 3\%$ accuracy. Vernier extends slowest sweep range to 15 sec/cm.

MAGNIFICATION: 7 calibrated ranges, X1, X2, X5, X10, X20, X50 and X100. Increases fastest sweep speed to 0.02 usec/cm X1, X2, and X5 ranges retain accuracy of original sweep except 0.02 usec/cm rate which is 5%.

TRIGGERING: Internal, external or power line. External trigger requires 1/2 volt or more, pos or neg going adjustable to ± 30 volts.

TRIGGER POINT

POSITIVE OR NEGATIVE GOING VOLTAGE: Triggering level of external trigger signal adjustable from -30 to $+30$ volts.

SWEEP OUTPUT

FROM PANEL JACK: -50 to $+50$ volts.

POWER REQUIREMENTS: 115 or 230 v ac $\pm 10\%$, 50 to 440 cps, 480 W.

GATE OUTPUT

FROM PANEL JACK: $+50$ v for sweep duration.

CALIBRATOR

WAVE FORM: 1000 cps square wave, 1 usec rise and decay.

OUTPUT: 0.2 mv to 100 volts peak to peak in nine calibrated ranges. Current output jacks provides 5 ma peak to peak. Voltage and current accuray on all ranges is $\pm 3\%$.

CATHODE-RAY TUBE: 5BHP2 normally supplied, flat face, 10000 volt accelerating potential. Pin type terminals for deflection plates.

DEFLECTION SENSITIVITY

VERTICAL: Approx 7.5 volts/cm.

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HORIZONTAL: Approx 30 volts/cm.

INTENSITY MODULATION: + 20 v pulse to blank a trace of normal intensity.

GRATICULE: 10 cm long x 4 cm high in centimeter square; 2 mn. Subdivisions on horizontal and vertical axis controlled edge lighting.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Oscilloscope AN/USM-140A includes:	2F6625-987-6603	14-3/4 x 19-3/4 x 24	96
1	Oscilloscope OS-121/USM-140		12-1/4 x 18 x 22-7/8	68
1	Dual Trace Preamplifier MX-2930A/USM		6 x 7 x 11-1/4	6
1	Auxiliary Plug-in MX-3078/USM		4-5/8 x 6 x 10-7/8	1.9
2	Prod, Test MX-2817/U			
2	Connector, Adapter UG-255/U			
2	Connector, Adapter UG-273/U			
4	Connector, Adapter UG-1441/U			
1	Cable Assembly CX-4704/U power, electrical		96	
2	Cord CG-409E/U		96	
2	Connector, Adapter UG-274A/U			
2	Technical Manual NAVSHIPS 94507A			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94507A: Technical Manual for Oscilloscope AN/USM-140A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA

TUBES: (1) 5BHP2A-1 (4) 6CL6 (28) 6922 (1) 6005/6AQ5W (1) 5726/6ALSW (5) 5642
(1) 5651WA (4) 7308 (1) DS-402

CRYSTALS: Not required.

SEMI-CONDUCTORS: (2) 1N276 (6) 1N277 (1) 1N540 (3) 1N754A (1) 1N979B (2) 1N1202
(12) 1N1566A (3) 1N3064 (1) 2N174 (8) 2N457 (10) 2N650 (6) 2N2084

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
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AN/USM-140A OSCILLOSCOPE

PROCUREMENT DATA

PROCURING SERVICE: USN

DESIGN COG: USN, BuShips

SPEC &/OR DWG: MIL-0-22237A(Ships)

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Hickok Electrical Instrument Co., Model 1807	Cleveland, Ohio	Nobsr-87629 Nobsr-87708	

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5 November 1964
Cog Service: USN FSN:

TEST SET, ELECTRONIC CIRCUIT PLUG-IN UNIT AN/USM-142(V)

Functional Class:

USA

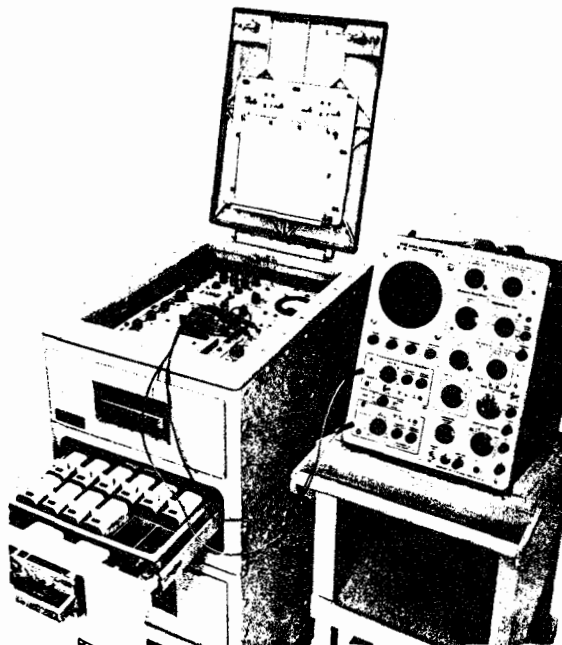
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Remington Rand Univac Division of Sperry Rand Corporation
Univac Park, (90536).



TEST SET, ELECTRONIC CIRCUIT PLUG-IN UNIT AN/USM-142(V)

FUNCTIONAL DESCRIPTION:

Test Set, Electronic Circuit Plug-in Unit AN/USM-142(V) generates test signals of the desired wave form, pulse repetition rate, and amplitude. Switches and potentiometers on the control panel enable the operator to set up the various conditions necessary for providing the specific module under test with an operational check.

No field changes in effect at time of preparation (29 October 1964)..

RELATION TO OTHER EQUIPMENT:

AN/USM-142(V) TEST SET, ELECTRONIC CIRCUIT PLUG-IN UNIT

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Tektronix Oscilloscope AN/USM140A, Model 545; (1) Tektronix Dual Trace Preamplifier MX-2930A/USM-105, Model CA; (1) Hewlett Packard Test Oscillator, Model 650A.

TECHNICAL CHARACTERISTICS:

INPUT POWER: 115 v ac ($\pm 10\%$) 400 cyc ($\pm 5\%$) 3 ph, 120W.

BLOWER: 115 v ac, ($\pm 10\%$) 400 cyc ($\pm 5\%$) single ph.

POWER SUPPLY CHARACTERISTICS

INPUT: 115 v ac ($\pm 10\%$) 400 cyc ($\pm 5\%$) 3 ph, regulated.

OUTPUT: + 2 v dc; - 3 v dc (regulated); + 15 v dc; - 15 v dc; + 54 v dc (regulated);
- 54 v dc.

CABLE CONNECTION

POWER: P1-1, 2, 3, 4 (grd).

SIGNAL LEVEL

LOGIC "1": - 3 (± 0.1) v.

LOGIC "0": Ground.

COOLING: 62.5 cfm forced air at sea level.

AMBIENT OPERATING TEMPERATURE: 60° C (140° F) max.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Test Set, Electronic Circuit Plug-In Unit AN/USM-142(V) includes:		21-1/2 x 38-1/2 x 42	500
1	Power Cord Assembly	96		1
1	Tool, Insertion 107-1015		1/2 x 1/2 x 7	1-7/16
1	Tool, Removal 107-1001		1/2 x 1/2 x 5	1-1/4
1	Tool, Crimping, Hand Oper- ated 11E13010		1 x 2-3/4 x 9	1-3/16
1	Universal Locator For Crimping Tool 11E13011-1		1/2 x 1/2 x 1	1/64
1	Universal Locator For Crimping Tool 11E13011-2		1/2 x 1/2 x 1	1/64

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94087(A): Technical Manual for Electronic Circuit Plug-In Unit Test Set,
AN/USM-142(V).

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

4.3 AN/USM-142(V): 2

TEST SET, ELECTRONIC CIRCUIT PLUG-IN UNIT AN/USM-142(V)

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	173.88	600

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Remington Rand Univac Division of Sperry Rand Corporation Univac Park	St. Paul, Minn.	NObsr 75750	

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UNCLASSIFIED

NAVSHIPS 93400

ELECTRONIC EQUIPMENT - PRELIMINARY DATA
NAVSHIPS 4457 (Rev. 11-56)

CLASSIFICATION of Equip. UNCLASSIFIED		COMMON NAME Oscilloscope	NOMENCLATURE AN/USM-152
SPECIFICATION		CONTRACT NUMBER AND DATE NObsr-75263 and NObsr-81284	DATE of request 15 Aug 1961
CONTRACTOR'S NAME AND ADDRESS Tektronix, Inc. New York, N. Y.		SERVICE APPROVAL LETTER - SERIAL AND DATE	

ELECTROCHEMICAL CHARACTERISTICS

POWER INPUT: **105 to 125 or 210 to 250 - 50 to 60 cycles - single phase**

OUTPUT SIGNAL CHARACTERISTICS (REP. RATE, I.F. ETC.)

OPERATING FREQ. AND FREQ. RANGE

ANTENNA OR TRANSDUCER (TYPE)

REFERENCE DATA AND LITERATURE

DRAWING	DWG. NUMBER	DIST. DATE	PUBLICATION	PUB. NUMBER
			TECHNICAL MANUAL	-
			OPERATING INSTRUCTION CHART	-
			PERFORMANCE STANDARD SHEET	-
			MAINTENANCE STANDARD BOOK	-

EQUIPMENT SUPPLIED

QTY	NOMENCLATURE AND NAME	OVERALL DIMENSIONS (IN)			H.D. (UNITS)	WEIGHT (LBS)
		HEIGHT	WIDTH	DEPTH		
	Oscilloscope AN/USM-152 (Mfgr's Model RM41A; WECC Part/Dwg No. G-330489) consists of: Accessories	14	19	22-1/2		
2	Binding Post Adapter (Mfgr's Part No. 013-004)					
1	Green Filter (Mfgr's Part No. 375-514)					
2	1-X Attenuator Probe (Mfgr's Part No. P410)					
1	Test Lead (Mfgr's Part No. 012-031)					
Note: The AN/USM-152 is a commercial off-the-shelf item unmodified by the contractor.						

IF ADDITIONAL EQUIPMENTS OR UNITS ARE REQUIRED, ATTACH ADDITIONAL SHEETS AND SPECIFY SOURCE.

CLASSIFICATION

80

UNCLASSIFIED

NAVSHIPS 93400

ELECTRONIC EQUIPMENT - PRELIMINARY DATA (CONT'D) (BACK)
NAVSHIPS 4457 (Rev. 11-56)

NOMENCLATURE	COMMON NAME
AN/USM-152	Oscilloscope
FUNCTIONAL DESCRIPTION: SKETCH, MFG. DIMENSIONS, ETC.	

The AN/USM-152 is an oscilloscope with a 5-inch screen for general use. It provides facilities for making visual observations of waveforms and voltages on various electronic equipments.

The sweep circuits include trigger (sweep) data and 0.2 to 100V amplitude. A polarity switch is included.

Rated deflection sensitivity through amplifier: 0.005V peak per cm vertical and 0.2V peak per cm horizontal.

There is no direct-connection, deflection-sensitivity rating.

Rated frequency response: dc to 240 kc per sec on X-axis, dc to 30 mc per sec on Y-axis, and no Z-axis rating.

Rated impedance for amplifier input: one megohm paralleled by 47 uufd on X-axis, 20 uufd on Y-axis, and no Z-axis impedance rating.

The AN/USM-152 is part of Sonar Test Set Group OA-3452/FQA-4(V).

No unit cost available

Source of information: Request for Nomenclature
Nomenclature correspondence
*Contract

*NOTE: No information concerning this equipment was obtainable from the contract.

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CLASSIFICATION
UNCLASSIFIED

12/1/62

CHANGE 66 - 689D

110

3 August 1965

Cog Service: USN

FSN:

OSCILLOSCOPE AN/USM-157

Functional Class:

USA

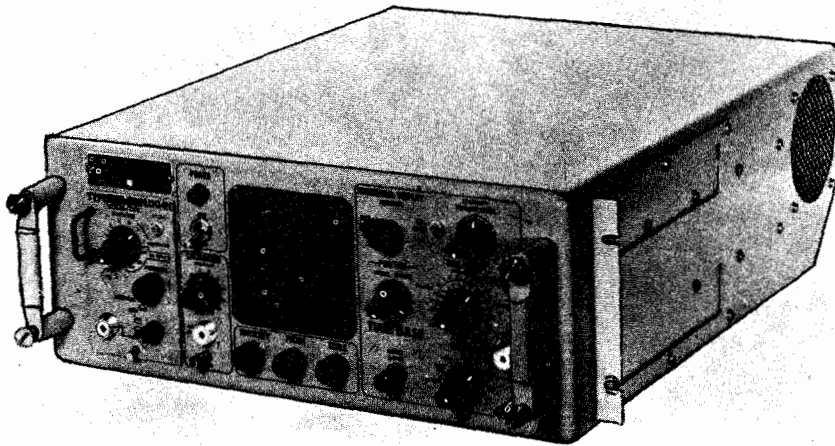
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Electronic Tube and Instrument Div. of General
Atronics Corp., (20183).



OSCILLOSCOPE AN/USM-157

FUNCTIONAL DESCRIPTION:

Oscilloscope, AN/USM-157 is a compact, general-purpose oscilloscope for slide-track mounting in a relay rack. It has calibrated vertical and horizontal amplifiers which permit easy measurement of various characteristics of the input signal, including amplitude, frequency, and pulse width.

The oscilloscope has two vertical input connectors. One located on the rear of the electrical equipment case, provides a permanent connection for monitoring signals from another unit mounted in a relay rack. The second vertical input connector, located on the front panel of the oscilloscope, facilitates monitoring signals from other components not mounted in the relay rack. Two triggering input signal connectors are provided also. One, located on the rear of the electrical equipment case, provides a permanent connection to any unit mounted in a relay rack from which triggering signals may be obtained. The second connector, located on the front panel, may be used to apply other triggering signals to the oscilloscope.

OSCILLOSCOPE AN/USM-157

The unit consists of eight circuits: Vertical Plug-in Preamplifier AM-3454/USM-157, vertical post amplifier, sweep trigger, sweep generator, horizontal amplifier, calibrator, low voltage power supply, and a high voltage power supply.

The circuits function as follows: The vertical Plug-in is a high-gain preamplifier having a basic 10 millivolts per division sensitivity. Output signals from the vertical plug-in are further amplified by the vertical post amplifier and then delayed before being applied to the vertical deflection plates. The sweep trigger selects internal or external triggering signals and provides an amplified, sharp positive-going spike coincident with the trigger input waveform, which is used to actuate the sweep generator. The generator provides a time display at the desired sweep speed from a wide range of calibrated sweep speeds from 2 seconds to 0.2 microsecond per division. Sweep may be either triggered or free-running. The horizontal amplifier selects either external or internal sweep signals and provides the horizontal deflection signals for the Cathode Ray Tube. Magnification of the sweep is accomplished by increasing the sensitivity of the output amplifier by a factor of five.

An internal voltage calibrator provides eleven square wave outputs which are used as a reference for accurate amplitude measurements. The low-voltage power supply provides regulated dc for all circuits throughout the oscilloscope. The high-voltage power supply provides a 9 kv potential to the post accelerator type Cathode Ray Tube, thus insuring a sharp bright trace.

No field changes in effect at time of preparation (2 July 1965).

RELATION TO OTHER EQUIPMENT:

The AN/USM-157 is similar to the AN/USM-109 but the AN/USM-157 is more versatile because it will accept the vertical plug-in preamplifier. It also has a higher CRT accelerating potential, insuring a sharper and brighter trace.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

VERTICAL PLUG-IN PREAMPLIFIER

INPUT IMPEDANCE

FRONT

DIRECT CONNECTION: 1 megohm in parallel w/approx 52 uuf.

WITH ATTENUATOR PROBE PR101: 10 megohms in parallel w/approx 20 uuf.

REAR

DIRECT CONNECTION: 1 megohm in parallel w/approx 140 uuf.

SENSITIVITY

CALIBRATED AC COUPLED TO 0.05 V PER DIV; DC COUPLED ABOVE 0.05 V PER DIV: 12 calibrated vertical sensitivities 0.01 to 50 v per scale div., accurate within 3%.

FREQUENCY RESPONSE

FRONT

DC COUPLED, VARIABLE CONTROL AT "CAL, VOLTS/DIV" SWITCH AT ANY POSITION BETWEEN 0.1 AND 50: DC to 10 mc, within 3 db (equivalent to rise time of 0.035 usec).

AC COUPLED, VARIABLE CONTROL AT "CAL, VOLTS/DIV" SWITCH AT ANY POSITION BETWEEN 0.01 AND 50: 2 cps to 9 mc, within 3 db.

REAR

DC COUPLED, VARIABLE CONTROL AT "CAL, VOLTS/DIV" SWITCH AT ANY POSITION BETWEEN 0.01 AND 50: DC to 1.5 mc, within 3 db.

OSCILLOSCOPE AN/USM-157

AC COUPLED, VARIABLE CONTROL AT "CAL, VOLTS/DIV" SWITCH AT ANY POSITION BETWEEN 0.01 AND 50: 2 cps to 1.5 mc, within 3 db.

VERTICAL POST AMPLIFIER

SENSITIVITY: 0.0715 v per div., fixed calibrated valve.

FREQUENCY RESPONSE: In excess of 10 mc within 3 db excluding vertical plug-in.

HORIZONTAL DEFLECTION SYSTEM

SWEEP RATE: 22 calibrated sweep rates from 2 sec to 0.2 usec per scale div., accurate within 3%.

UNCALIBRATED SWEEP RATE: Continuously variable sweep rates from 6 sec to 0.2 usec per scale div.; Expands sweep five times to the right and left of the screen center. Extends fastest sweep to 0.04 usec per scale div., accurate within 5%.

TRIGGERING SIGNAL

INTERNAL: Pulse w/an amplitude equal to 0.2 scale div.

EXTERNAL: 0.1 to 10 v peak-to-peak.

TRIGGERING FREQUENCY RANGE

NORMAL: DC to 2 mc.

HF SYNC: 2 to 15 mc (above sensitivity figures do not apply).

HORIZONTAL INPUT

DEFLECTION FACTOR "HORIZ ATTEN" FULLY CLOCKWISE: Approx 1.25 v per scale div.

FREQUENCY RESPONSE "HORIZ ATTEN" FULLY CLOCKWISE: DC to 500 kc, within 3 db.

VOLTAGE CALIBRATOR

OUTPUT WAVEFORM: Square wave at approx 1 kc.

VOLTAGES: 11 fixed v from 0.05 to 100 v peak-to-peak accurate within 3%.

POWER REQUIREMENTS

LINE VOLTAGE: 105, 115 or 125 v, 50 to 60 cps, 1 ph.

OPERATING POWER: 255 W, approx.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Oscilloscope AN/USM-157 includes:			
1	Oscilloscope OS-130(P)/USM-157		6-7/8 x 19 x 23-1/8	62.5
1	Vertical Plug-in AM-3254/USM-157		3-1/8 x 4-13/16 x 9	2.5
2	Test Probes PR 101			
1	Extension Cable (for Vertical Plug-in)			
1	Technical Manual NAVSHIPS 94428			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94428: Technical Manual for Oscilloscope AN/USM-157.

OSCILLOSCOPE AN/USM-157

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 5654/6AK5W (1) 6AN8 (4) 6BQ7A (1) 6CX8 (1) 6EAB (1) 5814A (1) 6AU6WA
(2) 6CL6 (8) 7895 (3) 7308 (1) EL86/6CW5 (1) M1051-P2

CRYSTALS: Not required.

SEMI-CONDUCTORS: (4) 1N538 (2) 2N1547 (1) 1N754A (1) 1N965B (4) 1N643 (2) 1N751A
(1) 1N758A (2) 1N941B (12) 1N3190 (5) 1N1734 (1) 2N1039-1
(9) 2N652A (4) 2N706 (4) 2N1011

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	12.7	144

PROCUREMENT DATA

PROCURING SERVICE: USN DESIGN COG: USN, BuShips
SPEC &/OR DWG: SHIPS-M-3768

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Electronic Tube and Instrument Div. of General Atronics Corp.	Philadelphia, Pa.	N0bsr-85210	

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UNCLASSIFIED
ELECTRONIC EQUIPMENT - PRELIMINARY DATA
NAVSHIPS 4457 (Rev. 9-62) (CONT'D)

NAVSHIPS 93400

DESIGNATION	ITEM NAME
AN/USM-164	Oscilloscope
FUNCTIONAL DESCRIPTION: SKETCH, MFG. DIMENSIONS, ETC.	

The AN/USM-164 is used to make visual observations of voltages and waveforms on various electronic components. It is the table-mounted version of Oscilloscope AN/USM-152. The set has a 5-inch screen.

Operating power requirements: 105v to 125v or 210v to 250v, 50 to 60 cycles, single phase.

The trigger sweep has an amplitude of 0.2 to 100 v. A polarity switch is included.

The rated deflection sensitivity through the amplifier is 0.005v peak per cm vertical and 0.2v peak per cm horizontal.

There is no direct-connection, deflection-sensitivity rating.

The rated frequency response is dc to 240 kc per sec on the X-axis, dc to 30 mc per sec on the Y-axis, and no Z-axis rating.

The rated impedance for the amplifier input is one megohm shunted by 47 uufd on the X-axis, 20 uufd on the Y-axis, and there is no Z-axis impedance rating.

The AN/USM-164 is part of Sonar Test Sets AN/FQM-3, AN/FQM-4 and AN/FQM-5.

No unit cost available

Source of information: Request for Nomenclature
No contract available
Nomenclature correspondence

4.3 AN/USM-164: 2

CLASSIFICATION
UNCLASSIFIED

12/1/62

CHANGE 66 - 689D

124

6 November 1964

Cog Service: USN FSN: 2F6625-994-8610

POWER MEASURING SET AN/USM-177

Functional Class:

USA

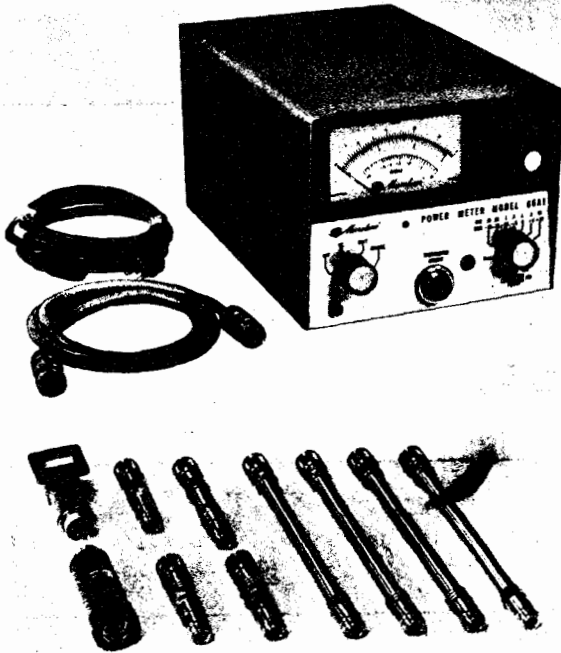
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Sperry Microwave Electronics Co. Div. of Sperry Rand Corp.,
(06424).



POWER MEASURING SET AN/USM-177

FUNCTIONAL DESCRIPTION:

Power Measuring Set AN/USM-177 is a portable measuring instrument designed to provide accurate microwave power measurements with relative freedom from drift in readings with changes in ambient temperature.

No field changes in effect at time of preparation (21 October 1964).

RELATION TO OTHER EQUIPMENT:

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

AN/USM-177 POWER MEASURING SET

TECHNICAL CHARACTERISTICS:

POWER RANGES: 7.

FULL SCALE READINGS: 10, 30, 100 and 300 uw, 1, 3 and 10 mw.

ACCURACY

ALL RANGES + 20 to 35° C: ± 3% of full scale.

ALL RANGES 0 TO 52° C: ± 5% of full scale.

ZERO CARRY OVER

WHEN ZEROED ON MOST SENSITIVE RANGE: Less than 2% of full scale.

POWER SUPPLY: 115 or 230 v ± 10%, 50 to 440 cps, 1.5 W.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Power Measuring Set AN/USM-177 includes:	2F6625-994-8610	6-1/2 x 7-3/4 x 12	10
1	Power Meter			
1	Coaxial Cable Assy			
1	Power Cord Set			
1	Battery 24 v Nickel Cadmium			
8	Coaxial Attenuators			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94688(A): Handbook of Operation and Maintenance Instructions for Power Measuring Set AN/USM-177.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: (4) 1N754 (5) 1N100 (5) 1N645 (1) 1N941 (5) 1N457 (6) 2N1370
(4) 2N1304 (1) 2N383 (4) 33514 (1) 2N1183

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
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PROCUREMENT DATA

PROCURING SERVICE: USN

DESIGN COG: USN, BuShips

SPEC &/OR DWG:

4.3 AN/USM-177: 2

POWER MEASURING SET AN/USM-177

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Sperry Microwave Electronics Co. Div. of Sperry Rand Corp.	Clearwater, Fla.	N0bsr-89000	\$921.00

96

12 August 1965

Cog Service: USN FSN:

ANALYZER, SPECTRUM TS-1921(XN-1)/U
Functional Class:

USA

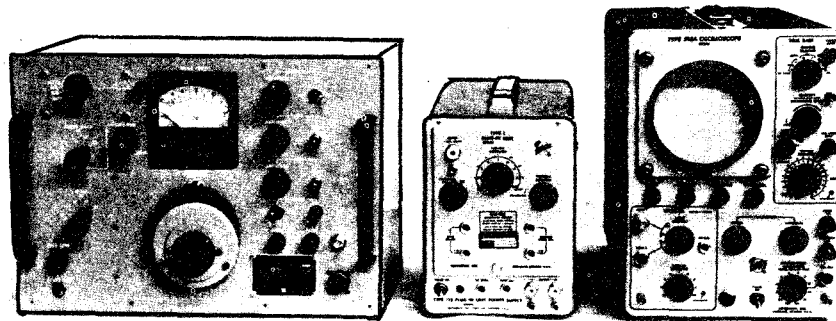
USN

USAF

TYPE CLASS:

Used by

MANUFACTURER'S NAME/CODE NUMBER: Scope Incorporated, (09430).



ANALYZER, SPECTRUM TS-1921(XN-1)/U

FUNCTIONAL DESCRIPTION:

Analyzer, Spectrum TS-1921(XN-1)/U is a portable, self-contained unit for measuring power components of a complex video waveform over the frequency range of 50 kilocycles to 25 megacycles. Single frequency measurements are determined from a front panel meter. A swept display is included and is used in conjunction with an external standard oscilloscope.

No field changes in effect at time of preparation (24 June 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Oscilloscope.

ANALYZER, SPECTRUM TS-1921(XN-1)/U

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 50 kc to 25 mc in 4 ranges; 50 kc to 1 mc, 5 mc, 10 mc or 25 mc. The 1 mc range can be positioned anywhere within the band.

SWEEP RATE: 30 cps.

INPUT SENSITIVITY (LESS PREAMP): 0.1 v rms.

MANUAL OPERATION: Will allow direct power measurement of single frequency components on front panel meter.

DISPLAY: Detected output suitable for use with standard type oscilloscopes.

AUXILIARY OUTPUT: Horizontal sweep voltage for use with standard type oscilloscopes.

METER INDICATION

RANGE: 0 to 10 db.

ACCURACY: ± 1 db.

INPUT IMPEDANCE: 90 ohms.

FREQUENCY CALIBRATION: $\pm 5\%$.

POWER REQUIREMENTS: 115 v, 50 to 1800 cps single ph, 50 W.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Analyzer, Spectrum TS-1921(XN-1)/U includes:		12 x 13 x 17	47.5
1	Plug-In-Unit Power Supply CBTV Type 132		7 x 10 x 19	21.5
2	Attenuator (50 ohm-93 ohm) CBTV-011-042		1 x 1 x 4	0.25

REFERENCE DATA AND LITERATURE:

Preliminary Technical Manual for Spectrum Analyzer TS-1921(XN-1)/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not available.

CRYSTALS: Not available.

SEMI-CONDUCTORS: Not available.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
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PROCUREMENT DATA

PROCURING SERVICE: USN

DESIGN COG: USN, BuShips

SPEC &/OR DWG:

4.3 TS-1921(XN-1)/U: 2

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ANALYZER, SPECTRUM TS-1921(XN-1)/U

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Scope Inc.	Falls Church, Va.	N0bsr-87642	

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